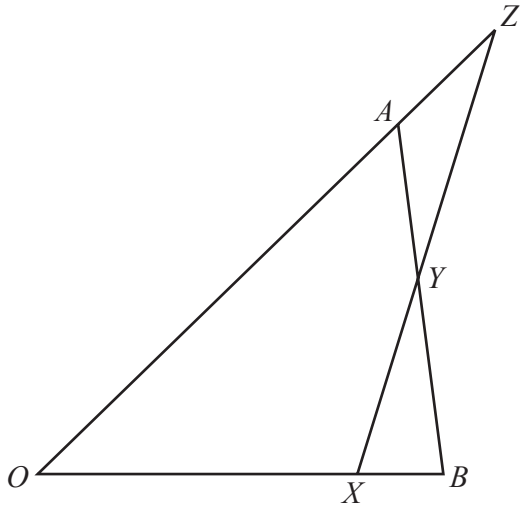
11



In the triangle OAB, $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OB} = \mathbf{b}$.

The straight line XYZ is such that:

- $\overrightarrow{OX} = \frac{4}{5}\mathbf{b}$
- $\overrightarrow{AY} = \frac{1}{3}\overrightarrow{AB}$
- $\overrightarrow{AZ} = \mu\mathbf{a}$, where μ is a constant
- $\overrightarrow{YZ} = \lambda\overrightarrow{XY}$, where λ is a constant.

(a) Show that $\overrightarrow{XY} = \frac{2}{3}\mathbf{a} - \frac{7}{15}\mathbf{b}$. [3]

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(b) Find $\overrightarrow{YZ}$ in terms of λ, **a** and **b**. [1]

(c) Find $\overrightarrow{YZ}$ in terms of μ, **a** and **b**. [2]

(d) Hence find the values of λ and μ, [3]

Question 12 is printed on the next page.

12 Solve the equation $3\,\text{cosec}^2\left(\frac{2x}{3}-\frac{\pi}{3}\right)=4$, for $0<x\leqslant 3\pi$. Give your answers in terms of π. [5]

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